

**DESCRIPTION OF A NEW CYPRINOID FISH (NOTROPIS STONEI) WITH  
NOTES ON OTHER FISHES OBTAINED IN THE UNITED STATES.**

BY HENRY W. FOWLER.

Several small collections of fishes obtained in various parts of the United States have been received at the Academy recently. A summary is presented herewith of those not reported previously, mainly as short annotated lists. One species obtained in South Carolina is described as new, and several others are recorded within new faunal regions or at new localities.

NEW JERSEY.

Mr. Henry S. Drinker has contributed interesting data on various sharks secured at Beach Haven. Dr. R. O. Van Deusen visited Blackwood in late April, 1920, and Tuckahoe, in Cape May County, on May 23, 1920. On September 12, 1920, the writer with Mr. Edwin Fowler, visited Laurie's Pond at Lakeside, near Yardville, in Mercer County. Mr. Wm. T. Innes visited Corson's Inlet on October 17, 1920, and sent a few notes on several common species seen there.

*Carcharias taurus* Rafinesque. Jaws of a small example, about 3 feet long, obtained at Brigantine during the past summer.

*Carcharodon carcharias* (Linné). Mr. Drinker reports a large example taken in a pound at Beach Haven, in early July, 1920. A small section of its skin, together with some copepods with which it was infested, were received later. As the specimen was largely butchered, Mr. Drinker had no opportunity to secure measurements or other data. This ferocious shark is only known in New Jersey waters from two previous records. The first notice is by Hussakof, who mentions seeing two teeth of a freshly caught specimen, alleged from the New Jersey coast, in early June of 1916. He estimated this specimen at 7 or 8 feet in length. Nichols reports the second example from off South Amboy, July 14, 1916, which he saw mounted, and measured  $7\frac{1}{2}$  feet in length. These records appear to have been the only ones in 1916 suggesting that the shark scare of that season may have been due in part to the presence of the great white shark. Our record shows that the species occurs casually. It may be present more frequently than is generally supposed.

*Eulamia milberti* (Müller and Henle). Mr. Drinker secured one August 8, 1919, 8 feet, 6 inches in length, which weighed 300 lbs. Another caught August 5, 1920, was 8 feet, 7 inches long, girth at gills 45 inches, and weight 300 lbs. These were captured at Beach Haven, as well as two smaller examples, without detailed data, but which show the teeth slightly more serrate, or the serræ coarser. Jaws from an example secured recently at St. Thomas, West Indies, by Mr. N. P. Alexander, agree in every respect.

*Hypoprion brevirostris* Poey. Mr. Drinker secured a fine example of this species at Beach Haven, on July 11, 1919. It measured 9 feet 6 inches in length and weighed 265 lbs. The jaws have been received at the Academy. This is the first record, so far as I know, of the occurrence of the short-nosed shark in New Jersey waters, or north of the Carolinas. It is therefore another interesting addition to our local fauna.

*Sphyrna zygaena* (Linné). Mr. L. Hoffman reported two examples, each about 7 feet in length, at Beach Haven, on September 11, 1920. Other species also seen by him at this locality were: *Mustelus canis*; egg-case of large skate, containing embryo (probably *Raja ocellata*), *Pomatomus saltatrix*, *Roccus lineatus*, *Cynoscion regalis*, *Sciaenops ocellatus*, *Micropogon undulatus*, *Leiostomus xanthurus*, *Menticirrhus saxatilis*, *Pogonias cromis*.

*Pomolobus pseudoharengus* (Wilson). Blackwood.

*Ameiurus natalis* (Le Sueur). Blackwood and Tuckahoe.

*Ameiurus nebulosus* (Le Sueur). Lakeside.

*Semotilus bullaris* (Rafinesque). Blackwood.

*Abramis crysoleucas* (Mitchell). Tuckahoe.

*Catostomus commersonnii* (Lacépède). Blackwood and Tuckahoe, also the next.

*Erimyzon sucetta oblongus* (Mitchill).

*Anguilla rostrata* (Le Sueur). Tuckahoe and Lakeside, also the next.

*Esox americanus* (Gmelin).

*Esox tridecemlineatus* Mitchill. Blackwood and Tuckahoe.

*Umbra pygmaea* (De Kay). Lakeside.

*Fundulus majalis* (Walbaum). Corson's Inlet, with the next two.

*Fundulus heterochitus macrolepidotus* (Walbaum).

*Cyprinodon variegatus* Lacépède.

*Euleptorhamphus brevoortii* Gill. The head of an adult example, now in the Academy, was secured by Dr. Witmer Stone. It was given to him by a collector, Mr. Cunningham, who picked it up on

the beach at Cape May several years ago. But a single previous New Jersey record is known, and that is still represented by the example in the Academy obtained at Atlantic City in 1870 and reported by Cope. The species is rare on the coast of the United States.

*Menidia menidia notata* (Mitchill). Corson's Inlet, with the next.

*Trachinotus carolinus* (Linné).

*Seserinus paru* (Linné). Dr. Van Deusen sent a fine example, received from Fortescue, on Delaware Bay, July 13. He also reports 40 examples taken at Atlantic City at the same time. These are the first definite records we have for this species in New Jersey, as Abbott only refers to it in 1868 as *Peprilus longimanus* and vaguely from "our coast."

*Pomoxis sparoides* (Lacépède). Blackwood.

*Acantharchus pomotis* (Baird). Tuckahoe, with the next two.

*Enneacanthus gloriosus* (Holbrook).

*Mesogonistius chætodon* (Baird).

*Lepomis auritus* (Linné). Blackwood, with the next.

*Lepomis incisor* Valenciennes.

*Pomotis gibbosus* (Linné). Blackwood and Lakeside.

*Micropterus salmoides* (Lacépède). Blackwood, with the next.

*Perca flavescens* (Mitchill).

*Boleosoma nigrum olmstedii* (Storer). Tuckahoe and Lakeside.

*Orthopristis chrysopterus* (Linné). Two at Ocean City, July 30 by Prof. C. La Wall and one at same place, September 17, by Mr. D. McCadden.

*Tautoga onitis* (Linné). Corson's Inlet.

#### PENNSYLVANIA.

Several collections were made by the writer with Dr. R. O. Van Deusen and Mr. Frederick Morrell, July 5, 1920, in Montgomery County: Mine Run, a tributary of the Perkiomen near Audubon; Skippack Creek near Lower Providence; western tributary of the Perkiomen near Doe Run and another near Yerkes; Perkiomen at Yerkes; West Swamp Creek, a tributary of the Perkiomen at Zieglerville; Rich Valley Creek at Sumneytown; North East Branch of Perkiomen Creek.

*Ameiurus nebulosus* (Le Sueur). Yerkes and North East Branch of Perkiomen, also the next.

*Schilbeodes insignis* (Richardson).

*Semotilus atromaculatus* (Mitchill). Near Doe Run and at Yerkes.

*Abramis crysoleucas* (Mitchill). North East Branch of Perkio-  
men.

*Notropis whipplii analostanus* (Girard). Lower Providence,  
Yerkes, Zieglerville, Sunneystown and North East Branch of Perkio-  
men.

*Notropis cornutus* (Mitchill). Same as last, except not found at  
Zieglerville.

*Notropis photogenis amœnus* (Abbott). Three examples, 64 to 83  
mm. in length, from Lower Providence. The smallest has a dis-  
torted vertebral column, so that its body in the vertical axis appears  
slightly sigmoid after the dorsal fin. The others are the largest  
examples I ever secured, and are spawning females, full of ova.  
Their depth is  $4\frac{1}{3}$  to  $4\frac{2}{5}$ . They were obtained in a pool, possibly  
30 inches deep, and are without brilliant coloration.

*Rhinichthys atronasmus* (Mitchill). Mine Run, near Doe Run and  
at Yerkes.

*Cyprinus carpio* Linné. Yerkes.

*Catostomus commersonnii* (Lacépède). Mine Run, Lower Provi-  
dence, Yerkes and North East Branch of Perkio-  
men.

*Erimyzon sucetta oblongus* (Mitchill). Yerkes.

*Anguilla rostrata* (Le Sueur). Yerkes and North East Branch of  
Perkio-  
men.

*Fundulus diaphanus* (Le Sueur). North East Branch of Perkio-  
men.

*Lepomis auritus* (Linné). Yerkes, Zieglerville and North East  
Branch.

*Pomotis gibbosus* (Linné). Yerkes and North East Branch.

*Micropterus dolomieu* Lacépède. North East Branch.

*Perca flavescens* (Mitchill). Yerkes.

#### DELAWARE.

Nine collections were made by the writer, with Messrs. H. E.  
Thompson and L. Dorsey, in the lower part of the State: West  
Branch of the Nanticoke, and East Branch, 4 miles west of Harring-  
ton, October 3, 1920; headwaters of Brown's Branch, near Harring-  
ton, October 4; Cedar Creek south of Lincoln City, from the P. R.  
R. down its lower course and passing two mill-dams, October 4;  
Indian River at Millsboro, October 5; estuary of creek flowing from  
Dagsboro, near Indian River Bay, October 5; Ocean View, October  
5; headwaters of Herring Creek, and lower fresh waters of same,  
October 6.

*Brevoortia tyrannus* (Latrobe). School of small ones in Indian River just below Millsboro.

*Anchovia mitchilli* (Valenciennes). Mouth of stream from Dagsboro.

*Schilbeodes gyrimus* (Mitchill). East and West Branches of Nanticoke.

*Abramis crysoleucas* (Mitchill). West Branch of Nanticoke, Cedar Creek at first dam, Millsboro and lower Herring Creek.

*Notropis hudsonius amarus* (Girard). West Branch of Nanticoke.

*Notropis chalybæus* (Cope). Cedar Creek at first and second dams, and lower Herring Creek.

*Erimyzon sucetta oblongus* (Mitchill). East Branch of Nanticoke.

*Anguilla rostrata* (Le Sueur). West Branch of Nanticoke and fresh pond at estuary of Herring Creek.

*Esox americanus* (Gmelin). West Branch of Nanticoke and Cedar Creek at upper dam.

*Esox tridecemlineatus* Mitchill. Cedar Creek at both dams, Millsboro and Herring Creek headwaters.

*Umbra pygmæa* (De Kay). West Branch of Nanticoke.

*Fundulus maja'is* (Walbaum). Estuaries from Dagsboro and Herring Creek.

*Fundulus heteroclitus macrolepidotus* (Walbaum). Localities as for last species, and in ditch at Ocean View.

*Fundulus diaphanus* (Le Sueur). Fresh ponds along Herring Creek estuary.

*Lucania parva* (Baird). Ocean View and Herring Creek, also the next.

*Cyprinodon variegatus* Lacépède.

*Gambusia affinis* (Baird and Girard). Lower dam on Cedar Creek, Millsboro, Ocean View and Herring Creek. In ponds and often in fresh water.

*Menidia beryllina* (Cope). Stream from Dagsboro and lower Herring Creek.

*Menidia menidia notata* (Mitchill). Estuary from Dagsboro stream.

*Apeltes quadracus* (Mitchill). Millsboro.

*Aphredoderus sayanus* (Gilliams). West Branch of Nanticoke Creek. Brown's Branch, upper Cedar Creek and first dam.

*Trachinotus carolinus* (Linné). The only fish we found in the surf at Bethany Beach. Along the shores of Delaware Bay, at Slaughter

Beach, the following were reported recently or during the warm period in late September: *Mustelus canis*, *Raja eglanteria*, *Dasyatis say*, *Brevoortia tyrannus*, *Alosa sapidissima*, *Pomolobus pseudoharengus*, *Cynoscion regalis*, *Leiostomus xanthurus* and *Micropogon undulatus*. But one *Acipenser sturio*, reported taken at the fishery below, during the spring.

*Acantharchus pomotis* (Baird). We captured a single adult in the upper waters of Herring Creek. This is an interesting addition to the fauna of the State.

*Enneacanthus gloriosus* (Hollbrook). East and West Branches of the Nanticoke, Cedar Creek at both dams and Herring Creek in fresh water.

*Mesogonistius chætodon* (Baird). Upper dam on Cedar Creek.

*Lepomis auritus* (Linné). West Branch of Nanticoke.

*Pomotis gibbosus* (Linné). With the last, also in Cedar Creek at the upper dam and in brackish water of stream from Dagsboro.

*Boleosoma nigrum olmstedii* (Storer). West Branch of Nanticoke and Brown's Branch.

*Boleichthys fusiformis* (Girard). West Branch of Nanticoke and Cedar Creek at both dams.

*Cynoscion nebulosus* (Cuvier). Estuary from Dagsboro stream, also the next.

*Pseudopleuronectes americanus* (Walbaum).

#### MARYLAND.<sup>1</sup>

Small collections were made in Barrow Creek, tributary to the Rhodes River, and Glebe Creek, a fresh tributary of the South River in Anne Arundel County, during May of 1920, with Mr. R. M. Abbott. In Cecil County Mr. H. L. Mather and the writer visited Elk Neck and Piney Creek Cove, on the Elk River, September 25, 1920. Two days later Stony Run and streams about North East and Charlestown were examined.

*Ameiurus catus* (Linné). Elk Neck.

*Ameiurus nebulosus* (Le Sueur). Glebe Creek.

*Hybognathus nuchalis regius* (Girard). Elk Neck and Piney Creek Cove.

*Abramis crysoleucas* (Mitchill). Glebe Creek, Stony Run and North East.

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<sup>1</sup> The only Virginia fishes received recently are a number of *Fundulus heteroclitus macrolepidotus* from the Warwick River, from partly salt water. They were obtained by Dr. Henry Tucker, March 5, 1919.



- Notropis bifrenatus* (Cope). Piney Creek Cove.  
*Notropis hudsonius amarus* (Girard). Elk Neck.  
*Notropis whipplii analostanus* (Girard). Stony Run and second brook above Charlestown.  
*Notropis cornutus* (Mitchill). Stony Run.  
*Erimyzon sucetta oblongus* (Mitchill). Piney Creek Cove.  
*Anguilla rostrata* (Le Sueur). Barrow Creek and North East.  
*Fundulus heteroclitus macrolepidotus* (Walbaum). Barrow Creek.  
*Fundulus diaphanus* (Le Sueur). Piney Creek Cove and North East, also the next.  
*Menidia beryllina* (Cope).  
*Menidia menidia notata* (Mitchill). Barrow Creek.  
*Apeltes quadracus* (Mitchill). Piney Creek Cove.  
*Seserinus paru* (Linné). One from the Rhodes River, obtained by Mr. Abbott, September 25, 1920.  
*Enneacanthus gloriosus* (Holbrook). Piney Creek Cove.  
*Lepomis auratus* (Linné). North East.  
*Pomotis gibbosus* (Linné). Piney Creek Cove, Elk Neck and North East.  
*Perca flavescens* (Mitchill). Elk Neck, second brook above Charlestown and North East.  
*Boleosoma nigrum olmstedii* (Storer). Piney Creek Cove.  
*Roccus lineatus* (Bloch). Elk Neck, North East, with next.  
*Morone americana* (Gmelin).  
*Leiostomus xanthurus* Lacépède. Barrow Creek.  
*Micropogon undulatus* (Linné). Barrow Creek and Elk Neck.  
*Gobiosoma bosc* (Lacépède). Barrow Creek.

#### SOUTH CAROLINA.

In May of 1917 Dr. Witmer Stone obtained an interesting small collection from the Pocataligo River, near Manning. He had previously visited this locality in 1914 and published a list of the fishes obtained then.<sup>2</sup> It is noteworthy that three of the species secured then are not represented in the present collection, though there are equally as many present not in the 1914 lot, and one appears new to science.

*Notropis stonei*, new species. Head  $3\frac{7}{8}$ ; depth 4; D. 11, 8; A. 11, 8; P. 1, 12; V. 1, 7; scales 30 in lateral line to caudal base and 3 more on latter; 7 scales above l. l. to dorsal origin, 3 below to anal

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<sup>2</sup> Copeia, September 15, 1914. No. 10.

origin; predorsal scales 18, snout 4 in head; eye  $3\frac{1}{8}$ ; maxillary  $3\frac{1}{4}$ ; interorbital  $2\frac{1}{6}$ ; second simple dorsal ray  $1\frac{1}{8}$ ; second simple anal ray  $1\frac{1}{5}$ ; pectoral  $1\frac{1}{3}$ ; ventral  $1\frac{1}{3}$ ; least depth of caudal peduncle  $2\frac{1}{5}$ ; upper caudal lobe 1.

Body well compressed, edges rounded, deepest at dorsal origin. Caudal peduncle compressed, least depth  $1\frac{1}{3}$  its length.

Head conic, moderately compressed, flattened sides moderately approximated below. Snout wide, conic, length  $\frac{2}{3}$  its width. Eye large, advanced, hind pupil edge nearly midway in head length. Mouth moderate, oblique, jaws even. Maxillary largely concealed, reaches eye. Premaxillaries protractile. Jaw edges moderately trenchant. Lips narrow. Mandible rather shallow and rami little elevated inside mouth. Nostrils together, near last  $\frac{2}{5}$  in snout. Interorbital broadly and evenly convex.

Gill-opening forward about opposite front pupil edge. Rakers small, weak, obsolete or scarcely evident. Filaments about half of eye. Isthmus narrow, especially forward, where frenum narrow. Pharyngeal teeth 5-4, well hooked, and broad grinding surfaces entire.

Scales large, well exposed, more or less uniform on trunk and smaller on caudal base, belly and breast. Scales cycloid; basal radiating striae 9; circuli rather coarse, 16 to 20, weak and obsolete apically. Scales disposed in longitudinal rows parallel with l. l., which continuous to caudal base and well decurved forward; small tubes simple.

Dorsal origin about midway between hind eye edge and caudal base, second simple ray longest. Anal rather well developed, like dorsal, inserted little nearer caudal base than pectoral origin. Caudal moderate, emarginate behind. Pectoral moderate, not quite reaching ventral. Last inserted well before dorsal, reaches anal. Vent close before anal.

Color in alcohol faded dull brown, paler or whitish below. Dark lateral band begins at snout tip and extends to caudal base, and on sides forward expanded until much wider than eye. Fins all pale, ventral and anal slightly whitish. Dorsal with dusky blotch forward near base. Lateral dark band ends in dusky blotch at caudal base size of pupil, which reflected out on median caudal rays basally. Along back pale longitudinal line separates color from back above.

Length 36 mm.

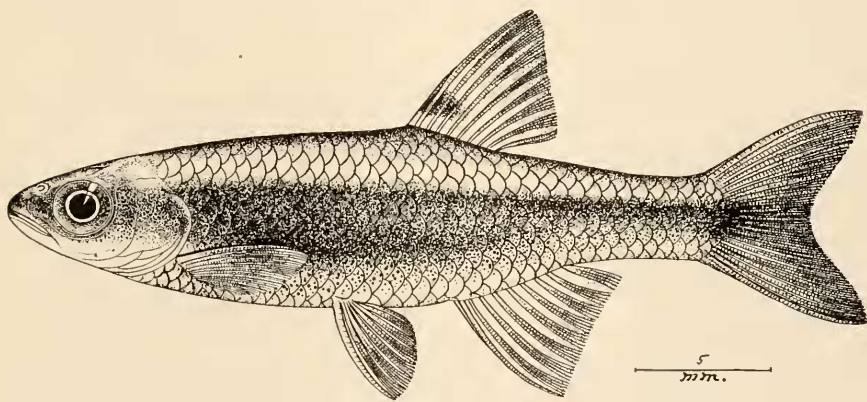
Type, No. 50,118, A. N. S. P. Pocataligo River near Manning. May 1917. Dr. Witmer Stone.



Paratypes, Nos. 50,109 to 50,121, same data. Head  $3\frac{2}{3}$  to  $3\frac{7}{8}$ ; depth  $4\frac{1}{8}$  to  $4\frac{3}{8}$ ; D. II, 7 or 8; A. II, 8; scales 29 ? to 32 in lateral line to caudal base, and several more on latter; predorsal scales 15 or 16; snout  $3\frac{1}{8}$  to  $3\frac{1}{4}$  in head from upper jaw tip; eye  $2\frac{1}{5}$  to 3; maxillary  $2\frac{7}{8}$  to 3; interorbital 3 to  $3\frac{1}{8}$ ; length 20 to 35 mm.

Of this species I have seen only the above examples. They apparently represent a species allied in the subgenus *Alburnops* as the pharyngeal teeth are uniserial and well hooked, lateral line complete, and large scales (less than 40) well exposed. *N. stonei* may readily be distinguished from the other lowland species of the genus, *N. roseus* and *N. chalybaeus*, by its extremely broad dark lateral band and dark blotch on the dorsal fin.

(For Dr. Witmer Stone, who collected the types.)



*Notropis stonei*, new species.

*Notropis chalybaeus* (Cope). Four examples.

*Fundulus nottii* (Agassiz). Abundant.

*Gambusia affinis* (Baird and Girard). Very abundant, females more so and greatly larger than males. Largest female 58 mm.

*Chænobryttus gulosus* (Cuvier). Several.

*Enneacanthus gloriosus* (Holbrook). Five examples, all dull in color.

#### GEORGIA.

On March 25, 1904, Mr. J. A. G. Rehn secured a few fishes in a small stream at Thomasville.

*Abramis crysoleucas bosci* (Valenciennes). Fifteen examples.

*Erimyzon sucetta* (Lacépède). One.

*Esox americanus* (Gmelin). One.

*Fundulus nottii* (Agassiz). Four.

*Lepomis megalotis* (Rafinesque). Ten. Also one on March 30.

#### FLORIDA.

Mr. Morgan Hebard obtained a fine lot of small fishes from the Everglades about Miami in March, 1920. Mr. Howard R. Hill sent a number of specimens and notes, on the fishes noticed during the fall of 1920, in Pensacola Bay near Pensacola. These are all indicated by the letter P.

*Scoliodon terræ-novæ* (Richardson). P.

*Dasyatis sabina* (Le Sueur). Three young from Allenhurst, July, 1917. H. W. Aitken. These show the front margins of the disk slightly concave opposite the nostrils.

*Elops saurus* Linné. P.

*Harengula pensacolæ* Goode and Bean. Young from Useppa Island, Lee County, obtained by Mr. Hebard in 1919.

*Brevoortia tyrannus patronus* Goode. P.

*Anchovia mitchilli* Valenciennes. P.

*Gymnothorax funebris* Ranzani. P.

*Fundulus similis* (Baird and Girard). Two smaller ones from Useppa Island, Charlotte Harbor, in May, 1919, obtained by Mr. Hebard.

*Fundulus grandis* Baird and Girard. Abundant and all of moderate size and variable. In alcohol many males with orange caudal, ventral and anal borders. In other specimens these fins gray. Tamiami Canal, Everglades. March 8 to 12. 1920.

*Fundulus confluentus* Goode and Bean. Large series from the Tamiami Canal. The species is more abundant than the preceding, which it greatly resembles. It may be distinguished at a glance by at least one blackish or dusky vertical line, or bar, on the caudal basally, also the presence of a black blotch ocellated with white on the last dorsal rays, which occurs in both sexes. It is very variable, the back mostly finely spotted with black or dusky, which usually assumes a greatly mottled appearance. In one example approaching melanism the ground-color in alcohol is pale warm brown above, greatly specked or spotted with blackish, the spots completely covering dorsal and caudal fins and extending well down side. Dark lateral bars very variable in intensity, mostly distinct or pronounced

in males and young. Male also with pectoral, anal and caudal more or less gamboge.

*Fundulus cingulatus* Valenciennes. Four from the Tamiami Canal. Color in alcohol largely dull olivaceous, with rounded pale scattered pearly spots on side. Anal with 9 branched rays.

*Jordanella floridae* Goode and Bean. Abundant at Muck, Tamiami Canal. In alcohol back shows 4 to 6 dull-brown saddle-like blotches. Younger or smaller examples more contrasted, with 7 or 8 dull brown vertical bars, which may be interrupted above to form alternately with dark blotches along back. All show black median lateral blotch.

*Mollienisia latipinna* Le Sueur. Very abundant, at Muck, with the preceding.

*Corythoichthys albirostris* Kaup. One received from Mrs. George Eubank, through Mr. Clarence B. Moore, from Marco in Lee County, obtained in April, 1919.

*Cypselurus heterurus* (Rafinesque). Many young, about 40 in all, from Miami Beach, obtained by Mr. Hebard. Largest 50 mm., smallest 13. These show great variation. The pectoral reaches back nearly far as tip of depressed ventral. Of the specimens counted anal shows 10 branched rays. Lower part of sides usually with 5 large dusky blotches. Pectoral blackish. Dorsal dark, though in some small examples dusky, and anal white like caudal.

*Strongylura notata* (Poey). P.

*Strongylura timucu* (Walbaum). P.

*Membras vagrans* (Goode and Bean). Small example from near Useppa Island, in Lee County, May, 1920.

*Menidia beryllina* (Cope). Young with the last.

*Mugil cephalus* Linné. Two in the Querimana stage, from near Useppa Island. Both have A. II, 9, and are 22-23 mm. in length.

*Sarda sarda* (Bloch). P.

*Scomberomorus maculatus* (Mitchill). P.

*Selar crumenophthalmus* (Bloch). P.

*Selene vomer* (Linné). P.

*Vomer setapinnis* (Mitchill). P.

*Trachinotus falcatus* (Linné). One from Miami Beach. Length 15 mm. D. VII, 20; A. III, 18.

*Seserinus paru* (Linné). P.

*Coryphæna hippurus* Linné. Seven from Miami Beach, largest 50mm.

*Gobiomorus gronovii* (Gmelin). Six from Miami Beach.

*Chænobryttus gulosus* (Cuvier). Abundant at Muck in the Tamiami Canal.

*Lepomis punctatus* (Valenciennes). Eight from the Tamiami Canal at Muck. All with long gill-rakers, and pectorals shorter than head. Spots variable.

*Lepomis megalotis* (Rafinesque). Very abundant with the last two. All small and quite variable in color. Many, especially larger, show a slightly darker spot on each scale basally, in alcohol. Most all show pale blue bars or lines on the snout, side of head and cheek. In none, though often wide, is the opercular flap produced. Many show dark fins. In all the rakers are short, rather weak and mostly less than 10. Pectoral always much less than head.

*Lepomis incisor* (Valenciennes). Four from the Tamiami Canal. Largely silvery when fresh in alcohol. No blue lines on side of head. Pectoral long as head and rakers lanceolate. Though small, these appear more slender than in the last species.

*Epinephelus striatus* (Bloch).<sup>3</sup> P.

*Epinephelus morio* (Valenciennes). P.

*Garrupa nigrata* (Holbrook). P.

*Promicrops guttatus* (Linné). During the winter of 1905 Capt. Willoughby secured a large adult example at Ft. Lauderdale, the skull of which is in the collection.

*Mycteroperca falcata phenax* Jordan and Swain. P.

*Lutjanus aya* (Bloch). P.

*Lagodon rhomboides* (Linné). P.

*Cynoscion nothus* (Holbrook). P.

*Bairdiella chrysura* (Lacépède). P.

*Leiostomus xanthurus* Lacépède. P.

*Menticirrhus americanus* (Linné). P.

*Abudefduf marginatus* (Bloch). Young example, 15 mm. long from Miami Beach.

*Halichæres bivittatus* (Bloch). P.

*Alutera schæpfii* (Walbaum). P.

*Chilomycterus schæpfii* (Walbaum). Two from South Boca Grande in Boca Grande Pass. Collected by Mr. Hebard in May, 1920. These are exactly the reverse of Eigenmann's statement that "in the young there seems to be more lines than in the old. Two speci-

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<sup>3</sup> Mr. Hebard secured an example of *Apogonichthys stellatus* Cope, 43 mm. long, at North Bimini Island, Bahamas, March 13, 1920.

mens examined, 3 inches long, have 17 lines between the pectorals; a specimen 5 inches long has 10 lines; and the largest specimen examined, 10 inches long, has 12 lines."<sup>4</sup> My larger example, 155 mm. long, has 21 lines between the pectorals; the smaller example, 132 mm. long, has 10 lines between the pectorals. Their general color-pattern is similar, even to the disposition of the black blotches, though these are quite variable, likewise the armature. The fins are pale or whitish, and uniform in color.

*Prionotus tribulus* (Bloch). P.

*Citharichthys macrops* (Dresel). P.

*Opsanus tau* (Linné). Allenhurst. November 11, 1917. H. W. Aitken.

*Gobiesox strumosus* Cope. Small one from an empty shell at Captiva Pass, south end of Lacost Island. Obtained by Mr. Hebard in May, 1920.

*Histrio histrio* (Linné). Of 21 young from Miami Beach, largest 45 mm. These show great variation in color-pattern, and even the smaller ones may be coarsely or finely variegated.

#### ILLINOIS.

With two exceptions, as noted, the following were secured by Mr. W. T. Innes in a small tributary of the Illinois River at Marley, in September 1, 1912.

*Campostoma anomalum* (Rafinesque).

*Chrosomus erythrogaster* (Rafinesque).

*Notropis cornutus* (Mitchill).

*Notropis atherinoides* Rafinesque. Mr. C. J. Hunt<sup>5</sup> sent eight examples from the West Fork of the South Branch of the Chicago River, January 24, 1911.

*Fundulus notatus* (Rafinesque).

*Micropterus dolomieu* Lacépède.

*Percina caprodes* (Rafinesque). Two obtained by Mr. Innes from Fox Lake in October, 1920.

*Boleosoma nigrum* (Rafinesque).

*Pæciliichthys cæruleus* (Storer).

*Pæciliichthys flabellaris* (Rafinesque).

*Cottus bairdii* Girard.

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<sup>4</sup> Ann. N. Y. Acad. Sci., 3, 1883-5 (1885), p. 308.

<sup>5</sup> Also several examples of *Semotilus atromaculatus* and *Perca flavescens* from Wawasee, Indiana, obtained July 12, 1913.

## WISCONSIN.

Mr. H. T. Wolf obtained the following in Booth's fish market, Milwaukee, during the summer of 1906:

*Coregonus quadrilateralis* Richardson. Lake Superior.

*Coregonus clupeaformis* (Mitchill). Lakes Superior and Michigan, and Georgian Bay.

*Leucichthys nigripinnis* (Milner). Milwaukee.

*Leucichthys prognathus* (H. M. Smith). Milwaukee.

*Salvelinus fontinalis* (Mitchill). Lakes Superior and Michigan.

*Cristivomer namaycush* (Walbaum). Milwaukee.

*Micropterus salmoides* (Lacépède). Fox Lake.

*Stizostedion vitreum* (Mitchill). Milwaukee, also next two.

*Stizostedion canadense* (Griffiths).

*Perca flavescens* (Mitchill).

## MINNESOTA.

Mr. F. L. Tappan secured the following about Minneapolis during September 1911:

*Semotilus atromaculatus* (Mitchill).

*Notropis heterodon* (Cope).

*Notropis cornutus* (Mitchill).

*Schilbeodes gyrinus* (Mitchill).

*Umbra limi* (Kirtland). Cedar Lake.

*Labidesthes sicculus* (Cope).

*Eucalia inconstans* (Kirtland).

*Pomoxis sparoides* (Lacépède).

*Lepomis megalotis* (Rafinesque).

*Boleosoma nigrum* (Rafinesque).

## MISSOURI.

Mr. Julius Hurter sent a small collection in July, 1912, from Fox Creek, a tributary of the Meramec River, at a point about 26 miles from St. Louis:

*Ichthyomyzon concolor* (Kirtland). Adult.

*Scaphirhynchus platyrhynchus* (Rafinesque). Young example.

*Polyodon spathula* (Walbaum). Young.

*Lepisosteus platostomus* (Rafinesque). Young.

*Amiatus calvus* (Linné). Small example.

*Campostoma anomalum* (Rafinesque). One from St. Louis in fall of 1915.

*Chrosomus erythrogaster* (Rafinesque). Several.



*Pimephales notatus* (Rafinesque). One from St. Louis received from Mr. W. T. Innes in 1918.

*Notropis cornutus* (Mitchill). Adult.

*Notropis zonatus* (Agassiz). Two.

*Lepomis humilis* (Girard). One from St. Louis. Obtained from Mr. Innes, November 1, 1920.

*Pæcilichthys cæruleus* (Storer). Several.

*Cottus bairdii* Girard. Several.

#### ARIZONA.<sup>6</sup>

Several species were secured by Dr. Henry A. Pilsbry in the fall of 1910 for the Academy.

*Campostoma anomalum* (Rafinesque). Dr. Witmer Stone obtained 6 young examples in a stream in Rucker Canyon, headwaters of the Rio Yaqui basin, at 6500 feet elevation in the Chiricahua Mountains, July 8, 1919.

*Leuciscus intermedius* (Girard). Very many from the Santa Cruz River at Tuecon, September 4, 1910, and a single example from the Salt River, tributary of the Gila at Tempe, September 5, 1910. Some of the larger examples tuberculated. These and the next all in Dr. Pilsbry's collections in the Academy.

*Cyprinodon macularius* Baird and Girard. One from the Salt River at Tempe.

*Mollienisia occidentalis* (Baird and Girard). Many with the last and from the Santa Cruz River at Tuecon.

#### UTAH.

The following were collected by Mr. Herbert J. Pack, of Logan, during the past season.

*Leuciscus lineatus* (Girard). Very many small ones from Hanyton Bridge, Bear River at Fielding, August 15. These all show but a short lateral line, not extending beyond the dorsal in the largest. Abundant in warm spring at Udy's Springs, Riverside, in Boulder County, August 12.

The largest example, from Magna, measures 100 mm. It and many young from slightly muddy fresh water, July 31.

*Leuciscus phlegethontis* (Cope). Two from meadow-streams in western part of Logan, August 9. Length 31 to 42 mm. Color of

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<sup>6</sup> Mr. S. N. Rhoads obtained the following in the fresh waters of the Colorado River delta, in the vicinity of the Hardy River, Mexico, in the early spring of 1905; *Ameiurus nebulosus*, *Xyrauchen texanus*, *Gila elegans*, *Cyprinus carpio* and *Mugil cephalus*.

larger example, when fresh in alcohol, with median dusky lateral band from snout, including mandible tip, to caudal base. This band very distinct and composed of rather large dots. Parallel from upper eye edge back to caudal peduncle and defining color of back, narrower similar band or line, mostly pale posteriorly. From pectoral axil side of body below broad dark lateral band pale cadmium to anal base, and more yellowish on lower surface of caudal peduncle. Axils of pectoral and ventral more or less tinged with pale citron-yellow, also basal portions of paired fins. Breast, belly and lower surface of head, white. Dorsal and caudal dull olive, other fins pale, with dusky terminal tints.

Also two from small pond at edge of railroad, Salt Lake City, August 31.

*Agosia nubila carringtoni* (Cope). Abundant in meadow streams in western Logan, August 9. Most with lateral line incomplete and barbel absent.

*Cyprinus carpio* Linné. One from Hanyton Bridge.

*Cottus semiscaber* (Cope). Abundant, in meadow streams in western Logan, August 9. Largest 58 mm.

#### NEVADA.

*Agosia nevadensis* (Gilbert). Twelve examples, largest 55 mm. long, from the Amargosa River at Beatty, August 12, 1919. Obtained by Messrs. J. A. G. Rehn and Morgan Hebard. These fish were found in small schools, in the larger pools, and moderately plentiful.

#### CALIFORNIA.

During the late fall of 1897 the Academy received from Prof. Harold Heath a collection of fishes from Pacific Grove, all of which are still in good condition. These are indicated by the letter P. I have also included several notes given by Mr. J. A. G. Rehn on some of the larger fishes seen by him at Santa Catalina in the summer of 1907.

*Polistotrema stouti* (Lockington). P.

*Galeorhinus zyopterus* Jordan and Gilbert. Four small gray sharks at Santa Catalina, about 3 to 5 feet long, were evidently this species.

*Raja binoculata* Girard. P.

*Torpedo californica* Ayres. P.

*Hydrolagus collieri* (Lay and Bennett). P.

*Pogonichthys microlepidotus* (Girard). Mr. F. S. Curtis forwarded an example of this and the following two species from Arroyo Crista Blanca at Livermore, which were received in September, 1912. He says, "in the winter and early spring this stream flows into the Bay of San Francisco, but in the summer is only a series of pools. The head of the stream is coarse gravel, several feet deep, and the water flows under ground between the deep pools. None of the pools are more than four feet deep, or usually only about two. The fish were caught in strong sulphur water, as just above the pool a strong sulphur-spring boiled up in the middle of the creek. This is so strong that it fills the air with the odor, and the stones, etc., in the pool are all coated with sulphur. About a dozen sculpins [*Cottus gulosus* (Girard)]  $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches long were caught, and were smooth. Those taken last year at Niles were prickly, with the sides rough. Together with the suckers [*Catostomus occidentalis* Ayres] and Sacramento perch [*Archoplites interruptus* (Girard)] they are about the only fish found here. The game-wardens are glad to have us take the dace as they are very destructive to the trout eggs and fry, and in fact the chief enemies they have in these streams."

*Ptychocheilus grandis* (Ayles).

*Myloleucus symmetricus* (Baird and Girard).

*Atherinopsis californiensis* Girard.

*Cypselurus californicus* (Cooper). Popular bait for tuna at Santa Catalina. Retailed for 10 cents each, or prices varied with abundance. Messrs Rehn and Hebard kindly furnished the note on this species and the following six.

*Auxis thazard* (Lacépède). Reported occasionally at Santa Catalina. One seen by Mr. Rehn  $4\frac{1}{2}$  feet long a mounted dry specimen. Called "Japanese tuna" and "short-finned tuna."

*Thunnus thynnus* (Linné). Four seen at Santa Catalina and a number of mounted examples. Previously, or ten days before Mr. Rehn's stay, 15 to 20 were taken, and many more were reported since. Some were upwards of 168 lbs., and one of such size had a large piece bitten out by a shark. The examples Mr. Rehn saw ranged from 110 to 125 lbs. They were captured altogether by rod and reel anglers, with flying-fish as bait.

*Germo alatunga* (Gmelin). Called "albacore" and "long-finned tuna." Abundant game fish at Santa Catalina. Mr. Rehn took two of 18 lbs., one of 20 lbs and one of 27 lbs. The species attains a weight of 50 lbs.

*Seriola dorsalis* (Gill). "Yellow tail." Several fresh ones seen at Santa Catalina. Taken closer in shore than the other fishes.

*Tetrapturus mitsukurii* Jordan and Snyder. One example, captured September 21, 1910, about five miles off the southeastern shore of Santa Catalina, measured nine feet in length. At the time the species was irregular, or only a few taken by the anglers. They break at the surface, but do not jump like the tarpon. They do not strike the hook but take it gradually, so that after a short interval the angler sets it with a jerk. Then a battle ensues for half an hour or more, in which time the fish becomes exhausted and is finally gaffed. Mr. Rehn did not hear the alleged name "marlin spike-fish" for it at Santa Catalina.

*Stereolepis gigas* (Ayres). "Jew fish." Mr. Rehn reports 6 or 8 large ones on the dock at Santa Catalina, and the largest 6 or 7 feet long.

*Genyonemus lineatus* (Ayres). This and all the following from Pacific Grove: *Zalemnius rosaceus* (Jordan and Gilbert), *Cymatogaster aggregatus* Gibbons, *Oxyjulis californicus* (Günther), *Sebastodes paucispinus* (Ayres), *Sebastodes elongatus* (Ayres), *Anoplopoma fimbria* (Pallas), *Scorpenichthys marmoratus* (Ayres), *Hemilepidotus jordani* Bean, *Taranichthys filamentosus* (Gilbert), *Eopsetta jordani* (Lockington), *Parophrys vetulus* Girard, *Microstomus pacificus* (Lockington), *Glyptocephalus zachirus* Lockington, *Citharichthys sordidus* (Girard), *Caularchus neandricus* (Girard), *Gibbonsia evides* (Jordan and Gilbert), *Anoplarchus atropurpureus* (Kittlitz), *Xiphidion rupestre* (Jordan and Gilbert), *Anarrichthys ocellatus* Ayres, *Chilara taylori* (Girard), *Porichthys notatus* Girard.